

User manual

How to used

- 1、download ubuntu 18.04 release, and install linux host
- 2、Reboot the system and the system will find the related hardware
- 3、Start “scan” operation and then link to the specific Ap
- 4、Check the conditions of AP and its channels using the instruction “iw dev”
- 5、Switching between module channels for changing AP channel

Feature	Description		
WLAN Standard	IEEE 802.11b/g/n/ax Wi-Fi compliant		
Frequency Range	2.412 GHz ~ 2.462 GHz (2.4 GHz ISM Band)		
Number of Channels	2.4GHz: Ch1 ~ Ch11		
Item	Value		Standard Value
Output Power	802.11b /1Mbps: 20 dBm $\pm$ 2 dB		EVM $\leq$ -9dB
	802.11b /11Mbps: 20 dBm $\pm$ 2 dB		EVM $\leq$ -9dB
	802.11g /6Mbps: 20 dBm $\pm$ 2 dB		EVM $\leq$ -5dB
	802.11g /54Mbps: 17 dBm $\pm$ 2 dB		EVM $\leq$ -25dB
	802.11n HT20 /MCS0: 19.5 dBm $\pm$ 2 dB		EVM $\leq$ -5dB
	802.11n HT20 /MCS7: 17dBm $\pm$ 2 dB		EVM $\leq$ -28dB
	802.11n HT40 /MCS0: 19 dBm $\pm$ 2 dB		EVM $\leq$ -5dB
	802.11n HT40 /MCS7: 17 dBm $\pm$ 2 dB		EVM $\leq$ -28dB
	802.11ax HE20/MCS0: 19.5 dBm $\pm$ 2 dB		EVM $\leq$ -5dB
	802.11ax HE20/MCS11: 14 dBm $\pm$ 2 dB		EVM $\leq$ -35dB
	802.11ax HE40/MCS0: 19 dBm $\pm$ 2 dB		EVM $\leq$ -5dB
	802.11ax/MCS11: 14 dBm $\pm$ 2 dB		EVM $\leq$ -35dB
SISO Receive Sensitivity (11b,20MHz) @8% PER	1Mbps	$\leq$ -92 dBm	$\leq$ -83 dBm
	11Mbps	$\leq$ -85 dBm	$\leq$ -76 dBm
SISO Receive Sensitivity (11g,20MHz) @10% PER	6Mbps	$\leq$ -87 dBm	$\leq$ -85 dBm
	54Mbps	$\leq$ -71 dBm	$\leq$ -68 dBm
SISO Receive Sensitivity (11n,20MHz) @10% PER	MCS=0	$\leq$ -86 dBm	$\leq$ -85 dBm
	MCS=7	$\leq$ -68 dBm	$\leq$ -67 dBm
SISO Receive Sensitivity	MCS=0	$\leq$ -83 dBm	$\leq$ -82 dBm
(11n,40MHz) @10% PER	MCS=7	$\leq$ -65 dBm	$\leq$ -64 dBm
SISO Receive Sensitivity (11ax,20MHz) @10% PER	MCS=0	$\leq$ -81 dBm	$\leq$ -74 dBm
	MCS=11	$\leq$ -55 dBm	$\leq$ -52 dBm
SISO Receive Sensitivity (11ax,40MHz) @10% PER	MCS=0	$\leq$ -74 dBm	$\leq$ -71 dBm
	MCS=11	$\leq$ -52 dBm	$\leq$ -49 dBm

Maximum Input Level	802.11b: -10 dBm
	802.11g/n/ax: -10 dBm

Feature	Description	
WLAN Standard	IEEE 802.11 a/n/ac/ax 2x2, Wi-Fi compliant	
Frequency Range	5.180 GHz ~ 5.240 GHz, 5.745 GHz ~ 5.825 GHz	
Number of Channels	5.0GHz: Please see the table1	
Item	Value	Standard Value
Output Power	802.11a /6Mbps: 20 dBm $\pm$ 2 dB	EVM $\leq$ -5dB
	802.11a /54Mbps: 16 dBm $\pm$ 2 dB	EVM $\leq$ -25dB
	802.11n HT20 /MCS0: 19 dBm $\pm$ 2 dB	EVM $\leq$ -5dB
	802.11n HT20 /MCS7: 16 dBm $\pm$ 2 dB	EVM $\leq$ -28dB
	802.11n HT40 /MCS0: 18.5 dBm $\pm$ 2 dB	EVM $\leq$ -5dB
	802.11n HT40 /MCS7: 16 dBm $\pm$ 2 dB	EVM $\leq$ -28dB
	802.11ac vHT20/MCS0: 19 dBm $\pm$ 2 dB	EVM $\leq$ -5dB
	802.11ac vHT20/MCS8: 15 dBm $\pm$ 2 dB	EVM $\leq$ -30dB

	802.11ac vHT40/MCS0: 18.5 dBm ± 2 dB		EVM ≤ -5dB
	802.11ac vHT40/MCS9: 15 dBm ± 2 dB		EVM ≤ -32dB
	802.11ac vHT80/MCS0: 18.5 dBm ± 2 dB		EVM ≤ -5dB
	802.11ac vHT80/MCS9: 14 dBm ± 2 dB		EVM ≤ -32dB
	802.11ax HE20/MCS0: 19 dBm ± 2 dB		EVM ≤ -5dB
	802.11ax HE20/MCS11: 14 dBm ± 2 dB		EVM ≤ -35dB
	802.11ax HE40/MCS0: 18 dBm ± 2 dB		EVM ≤ -5dB
	802.11ax HE40/MCS11: 14 dBm ± 2 dB		EVM ≤ -35dB
	802.11ax HE80/MCS0: 18 dBm ± 2 dB		EVM ≤ -5dB
	802.11ax HE80/MCS11: 13 dBm ± 2 dB		EVM ≤ -35dB
SISO Receive Sensitivity (11a,20MHz) @10% PER	6Mbps	≤ -87 dBm	≤-85
	54Mbps	≤ -71 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	MCS=0	≤ -86 dBm	≤-85
	MCS=7	≤ -68 dBm	≤-67
SISO Receive Sensitivity (11n,40MHz) @10% PER	MCS=0	≤ -83 dBm	≤-82
	MCS=7	≤ -65 dBm	≤-64
SISO Receive Sensitivity (11ac,20MHz) @10% PER	MCS=0, NSS1	≤ -83 dBm	≤-82
	MCS=8, NSS1	≤ -63 dBm	≤-60

(11ac,40MHz) @10% PER	MCS=0, NSS1	≤ -82 dBm	≤ -79
	MCS=9, NSS1	≤ -60 dBm	≤ -55
(11ac,80MHz) @10% PER	MCS=0, NSS1	≤ -81 dBm	≤ -79
	MCS=9, NSS1	≤ -57 dBm	≤ -54
(11ax, 20MHz) @10% PER	MCS=0	≤ -81 dBm	≤ -74
	MCS=11	≤ -55 dBm	≤ -52
SISO Receive Sensitivity (11ax,40MHz) @10% PER	MCS=0	≤ -74 dBm	≤ -71
	MCS=11	≤ -52 dBm	≤ -49
SISO Receive Sensitivity (11ax,80MHz) @10% PER	MCS=0	≤ -73 dBm	≤ -68
	MCS=11	≤ -51 dBm	≤ -46
Maximum Input Level	802.11a/n/ac/ax : -10 dBm		
Antenna Reference	external antenna with 2dBi peak gain		

Band range	Operating Channel Numbers	Channel center frequencies (MHz)
5180MHz~5240MHz	36	5180
	38	5190
	40	5200
	42	5210
	44	5220
	46	5230
	48	5240
5745MHz~5825MHz	149	5745
	151	5755
	153	5765
	155	5775
	157	5785
	159	5795
	161	5805
	165	5825

Integration instructions for host product manufactures according to KDB 996369 D03
OEM Manual v01.

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 &15.407 & 15.207 & 15.209.

2.3 Specific operational use conditions

The module is a WIFI module with 2.4G, 5G and 5.8G function.

The module can be used for applications with a maximum 2dBi antenna. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to

the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4 Limited module procedures

This module is FCC Part 15.247/ FCC Part 15.407 limited module. Limited for host type. The module only can integral in the host: Desktop PC (Mode: TPA-23A050200UU01), The host device with this integrated limit modular approval shall ensure the radiated emissions and spurious emission comply with FCC part 15.247&407. The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. When the host is changed, the module shall take additional test and certification. Or the final host shall be under a C2PC or New FCC ID certification.

2.5 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.

2.6 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance

20cm between the radiator and your body.

2.7 Antennas

Antenna Specification are as follows:

Type: External Antenna*2

Gain: 2 dBi

This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a unique antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.)

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re - evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Radiation Exposure Statement:

This module support WIFI(2412-2462MHz, 5180-5240,5745-5825MHz) which compliance with part 15.247 15.407 and apply for single module approval .

The module is limited to OEM installation only.

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

OEM integrator shall equipped the antenna to compliance with antenna requirement part 15.203& 15.204 and must not be co-located or operating in conjunction with any other antenna or transmitters. And OEM host shall implement a Class II Permissive Change (C2PC) or a new FCC ID to demonstrate complied with FCC standard.

The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

The final end product must be labelled in a visible area with the following: "Contains FCC ID: 2ADGH-6310"

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.407 &15.207 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.